

## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) System for compensating distortions induced by polarisation modulation dispersion (PMD) in optical transmission systems and in transmission fibres in particular, comprising

a measurement unit capable of~~means for~~ measuring PMD-induced distortions,

an PMD emulator unit for adjustable PMD levels, and

a controller which the output signal of said ~~measuring means~~ measurement unit is applied to and which serves to control said emulator unit,

characterized in that said PMD emulator unit is connected to an input signal from a transmission system, and further characterized in that said controller controls said PMD emulator unit in such way that continuous compensation of the PMD-induced signal distortion will be performed.

2. (Previously Presented) System according to Claim 1,

characterized in that said PMD emulator unit includes a variable PMD delay unit which consists of two PMD-involving elements with a polarisation regulator disposed therebetween.

3. (Previously Presented) System according to Claim 2,

characterized in that said PMD-involving elements are dispersive elements.

4. (Previously Presented) System according to Claim 2, characterized in that said PMD-involving elements of said variable PMD delay elements are polarisation-maintaining fibres.

5. (Previously Presented) System according to Claim 2, characterized in that said polarisation regulator of said variable PMD delay elements comprises a  $\lambda/2$  wave plate or a Faraday rotator.

6. (Previously Presented) System according to Claim 2, characterized in that said polarisation regulator is implemented by a rotatable connection of the coupling site of the two PMD-involving elements.

7-10. (Cancelled).

11. (Withdrawn-Currently Amended) System according to Claim 4 ~~or 10~~, characterized in that at least one pressurizing element creates a pressure on a plurality of fibre segments of said wound fibre at least at one site.

12. (Withdrawn) System according to Claim 11,

characterized in that said pressurizing element is an elongating element such as a piezo element that acts upon at least one circle segment bearing against said ring, and

that counter-segments are provided for at least one part of said circle elements, which bear against said fibre segments and create pressure on said fibre.

13. (Currently Amended) System according to Claim 2-4 or 7,  
characterized in that said two PMD-involving elements are birefringent crystals having a birefringence adapted to be electrically influenced.

14. (Withdrawn) System according to Claim 1,  
characterized in that the time lag of said two DGD elements of each basic emulator unit is equal to and distinctly greater than that of the associated connecting element.

15-29. (Cancelled).

30. (Withdrawn-Currently Amended) System according to Claim 1, ~~7 or 18~~,  
characterized in that a polarisation matching unit is disposed directly upstream of said polarisation measuring unit or directly downstream of said emulator.

31. (Withdrawn-Currently Amended) System according to Claim 1, ~~7 or 18~~,

characterized in that a polarisation matching unit is integrated as additional element into said emulator.

32. (Cancelled).

33. (Withdrawn) System according to Claim 1,  
characterized in that said PMD emulator unit is a variable infinite polarisation regulator having sufficient degrees of freedom, which projects said two PSP of the fibre to be compensated onto the PSP of said variable PMD delay element, without thoroughly controlling a local minimum of the overall PMD.

34. (Withdrawn) System according to Claim 33,  
characterized in that said variable polarisation regulator comprises an array of four  $\lambda/4$  wave plates disposed in tandem.

35-43. (Cancelled).

44. (Previously Presented) System according to Claim 1,  
characterized in that said controller comprises filters for generating a control signal, which filter out high-frequency spectral fractions of the data signal so that the filtered signal reflects the degree of distortion of said detected data signal.

45. (Previously Presented) System according to Claim 44,

characterized in that said controller comprises two different filters with respectively series-connected detectors on the output side, which generate two analog signals on the basis of said data signal, whose ratio reflects the degree of distortion of said data signal independently of the signal power.

46. (Previously Presented) System according to Claim 45,

characterized in that said controller minimizes the PMD-induced signal distortion by readjustment, in alternation, at the polarisation-influencing elements of said variable polarisation regulator and said variable PMD delay element.

47. (Withdrawn) System according to Claim 31,

characterized in that said PMD emulator unit is a variable infinite polarisation regulator having sufficient degrees of freedom, which projects said two PSP of the fibre to be compensated onto the PSP of said variable PMD delay element, without thoroughly controlling a local minimum of the overall PMD.

48. (Withdrawn-Currently Amended) System according to Claim 1, ~~7 or 18,~~

characterized in that said controller comprises several control loops in which it modulates regulator elements with different frequencies, that said controller derives from the output signal of said measuring means information about the amount and the phase position of the signal output from said emulator unit, and uses this information to perform a direct control function.